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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/553,107	04/20/2000	Edward S. Ellis	GJH-0018	4538
27810 7590 12/27/2007 ExxonMobil Research & Engineering Company P.O. Box 900 1545 Route 22 East Annandale, NJ 08801-0900			EXAMINER MCAVOY, ELLEN M	
			ART UNIT 1797	PAPER NUMBER
			MAIL DATE 12/27/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

09/553,107

Applicant(s)

ELLIS ET AL.

Examiner

Ellen M. McAvoy

Art Unit

1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 September 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7,9-12,16 and 18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7,9-12,16 and 18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-7, 9-12, 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harrison et al (5,292,428).

Applicants' arguments filed 11 September 2007 have been fully considered but they are not persuasive. As previously set forth, Harrison et al ["Harrison"] teach a process wherein hydrocarbon feedstock is passed through two or more hydrodesulfurization zones and connected in a series each containing a packed bed of solid catalyst. The liquid is passed from the first zone to the next until the final zone. Make up hydrogen is supplied to a hydrodesulfurization zone (i) other than the first hydrodesulfurization zone; hydrogen-containing gas is recovered from each hydrodesulfurization zone. The first hydrodesulfurization zone is supplied with hydrogen-containing gas recovered from a subsequent hydrodesulfurization zone (abstract). If the feedstock is, for example a diesel feedstock then the reaction conditions used in the process will typically be chosen to reduce the residual sulphur content to about 0.5 wt % S or less, e.g. about 0.3 wt % S or less, even down to about 0.05 wt % S or less and to reduce the aromatics content to about 27 volume % or lower, e.g. to about 20 volume % or less (column 9, lines 35-41). There will be used an amount of hydrogen which is equivalent to at least the stoichiometric amount of hydrogen required to desulphurise the feedstock and to achieve the desired degree of dearomatisation. Normally it will be preferred to use at least about 1.05 times such

stoichiometric amount of hydrogen (column 10, lines 3-9). The process can be carried out in a plant having two hydrodesulphurisation zones or in one having more than two such zones, for example 3, 4, 5, or more (column 10, lines 22-25). Different hydrodesulphurisation conditions may be used in different zones (column 10, lines 26-65). In column 18 of Harrison, Tables 1-3, heavy gas vacuum oil feedstock having 2.23 weight % sulphur content is converted to a product having 31 ppm S and 15.9 vol % aromatics. While Harrison differs from the instant claims in not requiring that a portion of the hydrogen-containing treat gas used in the first hydrodesulfurization stage is supplied from a source other than the present multi-stage process, it would have been obvious to the skilled artisan to have followed the teachings of the prior art and to have added additional reactant if so needed. The examiner maintains the position that it is not clear how the additional step of adding more of one of the same reactants (hydrogen-containing gas) results in an unobvious invention over that which is taught in Harrison.

Applicants argue that:

"Applicants have unexpectedly found that the amount of polynuclear aromatics (PNA) in a distillate fuel product can be substantially reduced by limiting the hydrogen portion of the treat gas in the second hydrodesulfurization stage to less than or equal to three times the chemical hydrogen consumption". And that "The Harrison reference provides no discussion of a distinction between PNA's and other aromatic compounds. Therefore, Harrison fails to even identify the problem of reducing the amount of PNA's preferentially to other aromatic compounds. Additionally, Harrison also does not have any discussion or suggestion of limiting hydrogen consumption in the second hydrotreatment stage as required by the claimed invention. Therefore, Harrison also fails to identify the process conditions required to achieve the beneficial effects of the claimed invention."

This is not deemed to be persuasive because polynuclear aromatics (PNA's) are not even mentioned in the claims so applicants are arguing points not relevant to the claimed invention.

Further, Harrison does disclose that the feedstock may comprise one or more aromatic hydrocarbons in amounts from about 1 volume % up to about 30 volume % or more. Harrison teaches that if the feedstock has an appreciable content of aromatic hydrocarbons, then at least some hydrogenation of these aromatic hydrocarbons to partially or wholly saturated hydrocarbons may also occur concurrently with hydrosulfurization. In this case, the hydrogen consumption will be correspondingly increased. See column 9, top.

Additionally, the claims recite in part (d) that "wherein the rate of introduction of the hydrogen portion of the treat gas in this second stage is less than or equal to 3 times the chemical hydrogen consumption in this second reaction stage...". The examiner is of the position that the treat gas amount of "less than or equal to 3 times" includes stoichiometric amounts of hydrogen required to desulfurize the feedstock. Harrison teaches that normally it will be preferred to use at least about 1.05 times the stoichiometric amount of hydrogen, and a hydrogen gas:feedstock molar feed ratio of from 2:1 to about 20:1 is taught. See column 10, lines 3-16. Thus the examiner is of the position that Harrison clearly meets the limitations of the above rejected claims.

THIS ACTION IS MADE FINAL. Applicants are reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

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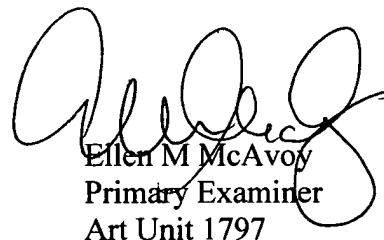
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CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ellen M. McAvoy whose telephone number is (571) 272-1451. The examiner can normally be reached on M-F (7:30-5:00) with alt. Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Ellen M. McAvoy
Primary Examiner
Art Unit 1797

EMcAvoy
December 17, 2007